

REMARKS

In the Office Action dated July 24, 2008, claim 17 was rejected under 35 U.S.C. §101 because the Examiner stated it is unclear as to whether the subject matter of that claim is directed to a method, process or system. In response, claim 17 has been amended to use the term “configured” to describe the features of the computer that is claimed in claim 17. The use of the word “configured” in this context is approved by United States Patent and Trademark Office procedural guidelines, and therefore claim 17 clearly, in conformity with the requirements of United States patent practice, claims a computer in terms of the features that it performs being claimed as structural components by use of the term “configured.” Claim 17 is therefore directed to statutory subject matter under the provisions of 35 U.S.C. §101.

Claim 17 also was rejected under 35 U.S.C. §112, second paragraph for the same reason, and the above-discussed amendment of claim 17 responds to this rejection as well. Claim 17, therefore, is submitted to be in full compliance with all provisions of §112, second paragraph.

Claims 15-17 were rejected under 35 U.S.C. §102(a) as being anticipated by Buzug et al. This rejection is respectfully traversed for the following reasons. The subject matter of claims 15-17 of the present application is for the purpose of distinguishing, from among all of the “edges” that are present in an anatomical medical image, those edges that represent the edges of diaphragm plates from edges that represent edges of anatomical features. This problem arises because generic edge detection algorithms will operate, as intended, to identify all edges in a medical image, and will not have the capability of determining or identifying whether

the detected images arise from anatomy or due to the presence of mechanical diaphragm plates that were used in generation of the image.

In the subject matter of claims 15-17, this separate detection of diaphragm edges from anatomical edges is undertaken by providing a computer with information, together with the image information, that describes a closed polygon formed by the diaphragm edges in the actual mechanical diaphragm itself that is used to generate the image. From this information describing the closed polygon, edges in the image can be distinguished that represent the mechanical diaphragm edges, from edges in the image that represent anatomical edges.

In the previous language of claims 15-17, as noted above, it was stated that the aforementioned information describing the closed polygon was supplied "together with" the image data. Applicants respectfully submit that under the normal rules for interpreting patent claims under United States patent practice, this necessarily means that the aforementioned information describing the closed polygon must be something different from the image data, otherwise it would have been redundant to state that this image information is supplied "together with" the image data. Nevertheless, each of independent claims 15-17 has been amended to explicitly state that this information describing the closed polygon is separate from the image data.

Additionally, Applicants submit that it is inherent that any information that describes a closed polygon must necessarily describe a relationship between more than one side of the closed polygon, even such information is merely in the form of a shape description such as the word "square." Applicants respectfully submit there is no way to describe a closed polygon without in some manner describing a

relationship between at least two sides of the polygon. Nevertheless, each of independent claims 15, 16 and 17 also has been amended to explicitly state that the information describing the closed polygon describes a relationship of multiple sides of the polygon to each other.

Applicants respectfully submit that, for the following reasons, the Buzug et al. reference did not anticipate any of claims 15-17 as previously presented, and further submit that the patentability of claims 15-17 is emphasized further by the aforementioned claim amendments.

In addition, the term “closed polygon” has been used throughout the independent claims.

In the Buzug et al. reference, the edges of the diaphragm are detected in the medical image exclusively by the conventional technique of analyzing greyscale values, as described in the paragraph beginning at column 4, line 27 of Buzug et al. In the Buzug et al. reference, each diaphragm shutter has an edge configuration that has a unique shape so as to be easily identifiable in such a conventional pattern recognition algorithm. In addition to using the pattern recognition algorithm to identify the edges of the diaphragm plates by greyscale value analysis, in the Buzug et al. reference each diaphragm shutter is provided with a series of perforations formed by lines at respective distances from the diaphragm shutter edge. Each of these lines of perforations has a different configuration (such as the closest to the edge having only one circular hole and otherwise being composed of elongate openings and a line next closest to the edge having two circular holes, etc.). Again, however, the identification of these lines is undertaken by conventional pattern recognition involving the greyscale values. There is no information concerning a

closed polygon that is provided to the computer in the Buzug et al. reference *in addition to* the image data. The entirety of the pattern recognition by greyscale value analysis in Buzug et al. reference is undertaken based on the image content itself, with no additional information being supplied, because no additional information is necessary.

The fact that information concerning a closed polygon does not enter into the analysis disclosed in the Buzug et al. reference is clear because the technique disclosed in Buzug et al. would work completely satisfactory if only one diaphragm shutter edge were present in the image. Clearly, a single diaphragm edge cannot represent a closed polygon, and therefore whatever information may be embodied in the image data represented by the diaphragm shutter, it does not, and cannot, represent information describing a closed polygon. Moreover, in view of the amendments to independent claims 15 and 17, the information employed in the Buzug et al. reference does not and cannot represent information describing a relationship between multiple sides in a closed polygon because, if that were the case, the Buzug et al. reference would not be operable to identify the side of only a single diaphragm shutter. Claims 15, 16 and 17 were additionally rejected, together with claim 2, as being anticipated by Van Eeuwijk et al. This rejection also is traversed for the following reasons.

Applicants submit that the Van Eeuwijk et al. reference does not go beyond the disclosure of the Buzug et al. reference, in the sense that the image analysis for edge detection takes place in Van Eeuwijk et al. exclusively by conventional pattern recognition, based on greyscale value analysis. There is no information that is employed in the Van Eeuwijk et al. reference *in addition to* the image data, for the

purpose of edge detection, and specifically there is no information employed in the Van Eeuwijk et al. reference describing a relationship of multiple sides of a closed polygon, as set forth in independent claims 15, 16 and 17.

In substantiating the rejection of claim 15 (as an example) the Examiner stated that the Van Eeuwijk et al. reference discloses analysis of an image that contains a polygon formed by the edges of a mechanical diaphragm and also containing anatomical image edges representing the anatomy of the subject, citing the Abstract and Figure 1. The Examiner also cited column 9, line 2 and Figure 4 of Van Eeuwijk et al. as, according to the Examiner, supplying information describing a closed polygon, together with the image data, for the purpose of conducting the image analysis.

Applicants respectfully submit that the hatched area shown in Figure 1 of Van Eeuwijk et al. does not represent a diaphragm, and therefore the fact that it may happen to be in the form of a closed polygon is irrelevant. The area identified in Figure 1 (and Figure 3 as well) of the Van Eeuwijk et al. reference merely represents a *search area* within the image, in which the presence (or absence) of a diaphragm edge will be sought. The searching within this area proceeds exclusively by brightness value evaluation, as described extensively throughout the Van Eeuwijk et al. reference, and in particular in connection with Figures 2a through 2c, in the passage beginning at column 9, line 38. The edge detection proceeds exclusively by detecting brightness transitions, as is explicitly described in the passage discussing Figure 4 relied upon by the Examiner. This passage is at column 10, beginning at line 25.

Therefore, the Van Eeuwijk et al. reference does not disclose all of the elements of any of claims 15-17 as arranged and operating in those claims, and thus does not anticipate any of those claims, nor claim 2 depending from claim 15.

Applicants note with appreciation that claims 3-12 were stated to contain allowable subject matter, and would be allowable if rewritten in independent form. In view of Applicants' belief that independent claims 15-17 are allowable over the prior art of record, those claims have been retained in dependent form at this time.

An editorial amendment has been made in claim 6, which is supported in the specification as originally filed at page 3, line 16. A misspelling also has been corrected in claim 7.

Since it is expected that making the above changes would be considered by the Examiner as raising a new issue requiring further searching or consideration, the present Amendment is accompanied by the filing of an RCE, and entry and consideration of the present Amendment are therefore respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required, or to credit any overpayment to account No. 501519.

Submitted by,



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